DOCUMENT RESUME

ED 191 859 TM 800 465

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TITLE Sex and Ethnicity Affect School Outcomes--Separately.
INSTITUTION Texas Univ., Austin. Research and Development Center for Teacher Education.
SPONS AGENCY National Inst. of Education (DHEW), Washington, D.C.
PUB DATE Apr 79
NOTE 13p.: Paper presented at the Annual Meeting of the American Educational Research Association (63rd, San Francisco, CA, April 8-12, 1979).

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Academic Achievement: Black Students: Coping: *Ethnicity: Grade 6: Intermediate Grades: Language Arts: Mexican Americans: *School Attitudes: *Sex Differences: Social Studies: White Students
IDENTIFIERS Austin School District TX

ABSTRACT

Effects of sex, ethnicity and their interaction on initial status and year-long change in (1) Language Arts and Social Studies achievement: (2) attitude toward school, and (3) self-rated coping were examined. Subjects included 1657 sixth graders from 51 classes in Austin, Texas. Each class was comprised of a mixture of Anglos, Blacks, and Chicanos in the same proportions as in the Austin community as a whole. Analysis of the attitudes and coping measures included all students, but the Social Studies data included only 41 classes, and the Language Arts data included 10 classes. Achievement was measured by the Comprehensive Tests of Basic Skills (CTBS): attitude by the School Sentiment Index (SSI): and coping by the Student Sentence Completion (SSC-C). Initial differences due to sex and ethnicity were assessed for each of the measures, and used to predict change in the students' scores. Results indicated that sex differences for all measures existed initially or emerged by the end of the year, and that ethnic differences were consistently found in a achievement. No sex by ethnicity interactions were obtained. (Author/RL)

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SEX AND ETHNICITY AFFECT SCHOOL OUTCOMES -- SEPARATELY

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Paper presented at the annual meeting of the American Educational Research Association held in San Francisco, April 8-12, 1979.

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ABSTRACT

The present study examined the effects of sex and ethnicity and their interaction on initial status and year-long change in (1) Language Arts and Social Studies achievement, (2) attitude toward school, and (3) self-rated coping. Subjects were 1657 sixth graders from tri-ethnic schools. The results indicated that for all measures, sex differences either existed initially or emerged by the end of the year. Ethnic differences were consistently found in achievement. Anglos and Chicanos tended to perform similarly, and their gain pattern with respect to pretest level differed from Blacks. No sex by ethnicity interactions were obtained. Other results and possible implications are discussed.

JUL 3 1980

Sex and Ethnicity Affect

School Outcomes -- Separately

Introduction

A considerable body of literature exists with respect to sex and ethnic differences in outcome of schooling. However, the results of most of these studies were limited to (A) academic achievement with a focus on reading, verbal ability, and/or mathematics; (B) sex or ethnic differences separately, without regard to their possible interaction; and (C) emphasis on achievement status rather than change over the course of the school year. This study takes account of multiple cognitive and affective outcomes, it tests for an interaction of sex and ethnicity, and it studies year-long change as well as initial status on each of the outcome variables.

Method

Data on each of these measures described below were collected in the fall of 1974 (pretest) and then again in the spring of 1975 (posttest). The total sample consisted of 53 sixth-grade classes in Austin, Texas (N=1657). Students were randomly assigned to classes, with the provision that they be racially mixed (Anglos, Blacks, and Chicanos) in the same proportions as the Austin community as a whole. For the present analysis, 51 of these classes were used, two classes were lost because they lacked data on one or more of the pre- or posttest measures. While analyses of the attitude and coping measures included all 51 classes, the sample was split with regard to achievement. The Social Studies data are based on 41 classes and the Language Arts are based on 10.

In the cognitive domain, (A) Language Arts and (B) Social Studies were assessed through the use of standardized achievement test scores obtained on the Comprehensive Tests of Basic Skills (CTBS; CTB/McGraw Hill, 1974). KR-20 reliability for the tests used ranges from 0.76 to 0.99. In the affective domain, attitude toward school was measured by the School Sentiment Index (SSI), an instrument developed by the Instructional Objectives Exchange (1972) and modified for use in this study (KR-20 = 0.72; test-retest = 0.87, t = 2 weeks). Finally, in the conative domain, self-rated coping was measured by the Student Sentence Completion (SSC-C), a multiple-choice measure of independent coping skills (Peck, R.F., 1973; alpha = 0.69; test-retest = 0.68, t = 3 weeks).

Initial differences due to sex and ethnicity were assessed for each of the measures through the use of a step-down multiple regression technique which essentially parallels a standard analysis of variance approach. Each of the pretests served, in turn, as the dependent variable, and the main effects of sex and ethnicity, along with their interaction, were tested.

In the second stage of the analysis, sex and ethnicity were used to predict regressed change in the students' scores on each of the dependent measures. A step-down linear regression technique was again employed. This procedure parallels a traditional analysis of covariance design with the posttest scores serving as the dependent variables and the pretests as the covariates. The step-down technique was used to assess the 3-way, and then 2-way interactions involving the independent variables of sex and ethnicity and the pretest, and finally, the sex and ethnicity main effects. Since sample size is large, the criterion for reported significance for all of the tests conducted is $p < 0.01$, with the amount of variance accounted for approximately 1% or greater.

Results

The results of the pretest comparisons are as follow:

(1) Achievement (CTBS). Both sex and ethnic differences were found with respect to the initial level of performance on Language Arts, $F(1,227) = 13.61$, $p < .01$, % V (percent of variance) = 5.7, and $F(2,226) = 24.88$, $p < .01$, % V = 18 respectively. However, the interaction between the two variables was not significant. With respect to sex, the findings indicated that females (M = 540.74) scored higher than males (M = 503.54). Planned comparisons between the scores of the three ethnic groups indicated that Anglos (M = 535.4) did not significantly differ from Chicanos (M = 505). The Anglos differed significantly from the Blacks (M = 423.58), $F(1,226) = 48.69$, $p < .01$, % V = 17.7. The Chicanos also differed significantly from the Blacks, $F(1,226) = 12.63$, $p < .01$, % V = 4.6.

On Social Studies, the main effect for sex was not significant. The main effect for ethnicity was found significant, $F(2,953) = 113.52$, $p < .001$, % V = 19.2. Tests for simple effects showed that Anglos (M = 509.42) significantly differed from Chicanos (M = 449.0) and Blacks (M = 415.19), $F(1,953) = 84.60$, $p < .001$, % V = 7.2, and $F(1,953) = 183.66$, $p < .001$, % V = 15.6, respectively. Thus, the Anglos obtained the highest scores, followed by Chicanos, and then Blacks. The sex by ethnicity interaction was not significant.

(2) Attitude toward school (SSI). The main effect for ethnicity, as well as the sex by ethnicity interaction, was not significant. Sex differences were significant, $F(1,1469)$, $p < .001$, % V = 3.4. Females' attitude toward school (M = .75) was more favorable than males' (M = .68).

(3) Self-rating coping (SSC-C). There were no differences on the coping measure due to sex, ethnicity, or their interaction.

With regard to regressed change, the results were as follow:

(1) Attitude toward school (SSI). Girls had more positive attitudes toward school than boys at the outset, and they maintained a more positive attitude over the school year as compared to the attitude of boys, $F(1,1254)$, $p < .01$, % V = .91. This effect was constant at each level of the pretest. There were no ethnic differences in attitude change over the year. The interaction between sex and ethnicity, as well as the tests for heterogeneity of pretest regression slopes, were not significant.

(2) Self-rated coping (SSC-C). Although no sex differences were found on the pretest, females gained more in coping skills than males, $F(1,1268)$, $p < .01$, % V = 1.1. This difference in gain was

constant at all levels of the pretest. The ethnicity main effect on regressed change was also significant, $F(2,1267)$, $p < .01$, % V = 1.0. Since the assumption of homogeneity of regression slopes was supported, comparisons between group means (adjusted for pretest) indicated that only the Anglo-Black difference was significant, $F(1, 1267)$, $p < .01$, % V = 1.0; the Anglos gained more.

(3A) Achievement - Language Arts (CTBS).
Sex differences in Language Arts were found to be significant, $F(1,226)$, $p < .01$, % V = 8.6. Females gained significantly more than males at each level of the pretest. The test for homogeneity of pre-post regression slopes for the three ethnic groups was significant, $F(2,223) = 10.19$, $p < .01$, % V = 4.1. The post on pre regressions for the three ethnic groups, over the distance pretest mean $\pm$ 1 S.D. for each group, are graphically presented in Figure 1. The pretest mean and performance score on Language Arts and the standard deviation of each ethnic group are presented in Table 1. As can be seen in Figure 1, the regression slope of the Chicanos significantly differed from the slope of the Anglos, $F(1,223) = 5.73$, $p < .05$, % V = 1.2 as well as from the slope of the Blacks, $F(1,223) = 17.57$, $p < .001$, % V = 3.5. The regression slope of the Anglos also significantly differed from the slope of the Blacks, $F(1,223) = 12.6$, $p < .001$, % V = 2.5. Furthermore, there was little overlap in pretest scores between Anglos and Blacks. The sex by ethnicity interaction was not significant.

(3B) Achievement - Social Studies (CTBS).
Sex differences in Social Studies were found to be significant. $F(1,953) = 9.93$, $p < .01$, % V = 1.0. Females gained significantly more than males at each level of the pretest. The pre-post regression slopes of the three ethnic groups differed significantly, $F(2,950) = 17.10$, $p < .001$, % V = 1.6. Comparisons among the group slopes indicated that the slope of the Anglos and Chicanos differed significantly from the slope of the Blacks, $F(1,950) = 34.13$, $p < .001$, % V = 1.6, and $F(1,950) = 17.56$, $p < .001$, % V = .8, respectively. The difference in slope of Anglos compared to the Chicanos was not significant. The post on pre regressions for the three ethnic groups are graphically presented in Figure 2. The pretest mean performance scores on Social Studies and the standard deviation of each ethnic group are presented in Table 2.

Summary and Implications

Sex differences were found either to exist at the beginning of the sixth grade or to emerge by the end of it, in each of the areas measured. In all cases, where differences were significant, females showed more favorable initial status or more gain than males. In terms of percent of variance accounted for, this effect was strongest with respect to Language Arts (approximately 5-6% on the pretest, 8% of the regressed change).

The Language Arts findings are typical of those reported in the literature (see, for example, Maccoby, 1974; and Glickman, 1976), as are the findings regarding attitude toward school (Antes, Andersen, and DeVault, 1965; Jackson, 1968; and Haladyna, 1977). Little information has appeared elsewhere regarding sex differences in Social Studies achievement or in coping skills. For Social Studies, at least one finding is in conflict with that obtained here (Mullis, 1975), where males' achievement was higher than that of females. Overall, though, the girls do better in school, all around.

A particularly interesting finding is that sex differences were not modified by ethnicity. In view of the current general opinion that sex differences arise primarily from the learning of sex roles, this finding implies that the definition of masculine and feminine roles, as students, is much more similar than not in these three ethnic groups. There do not appear to be major cultural differences in the way boys and girls are expected to achieve -- none, at least, that produce differential outcomes.

Ethnic effects on achievement were strong and important. Black children started sixth grade far behind most Anglos and Chicanos in both Language Arts and Social Studies. Over the year, what is more, the Black students showed less gain from their starting-points than did the Anglos and Chicanos. Indeed, in Language Arts, the Chicanos tended to gain even more, over the year, than the Anglos.

Viewed another way, these data say that the amount of gain over the year cannot be predicted with maximum accuracy just from knowledge of the children's pretests, alone. Low-scoring Anglos or Chicanos will tend to gain more than Blacks who have the same pretest achievement score. At higher levels of initial achievement, the ethnic difference in gain tends to become even greater.

These data do nothing to explain why the Black students have this handicap, but they certainly emphasize the disadvantage they suffer. Such a pattern, if repeated for several, successive years, would inevitably put most Black graduates at a marked disadvantage in their skill mastery, and in any practical consequences this may have. Clearly, further research is urgently needed to identify the dynamics of this progressive deterioration of the Blacks' position and to find ways to reverse it.

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Table 1

Means and Standard Deviations for
Anglos, Blacks, and Chicanos
on Language Arts Pretest

	Mean	S.D.
Anglos	535.547	69.12
Blacks	423.586	87.38
Chicanos	505.349	64.78

Table 2

Means and Standard Deviations for
Anglos, Blacks, and Chicanos
on Social Studies Pretest

	Mean	S.D.
Anglos	509.43	78.74
Blacks	415.19.	67.85
Chicanos	449.00	73.97

Figure 2

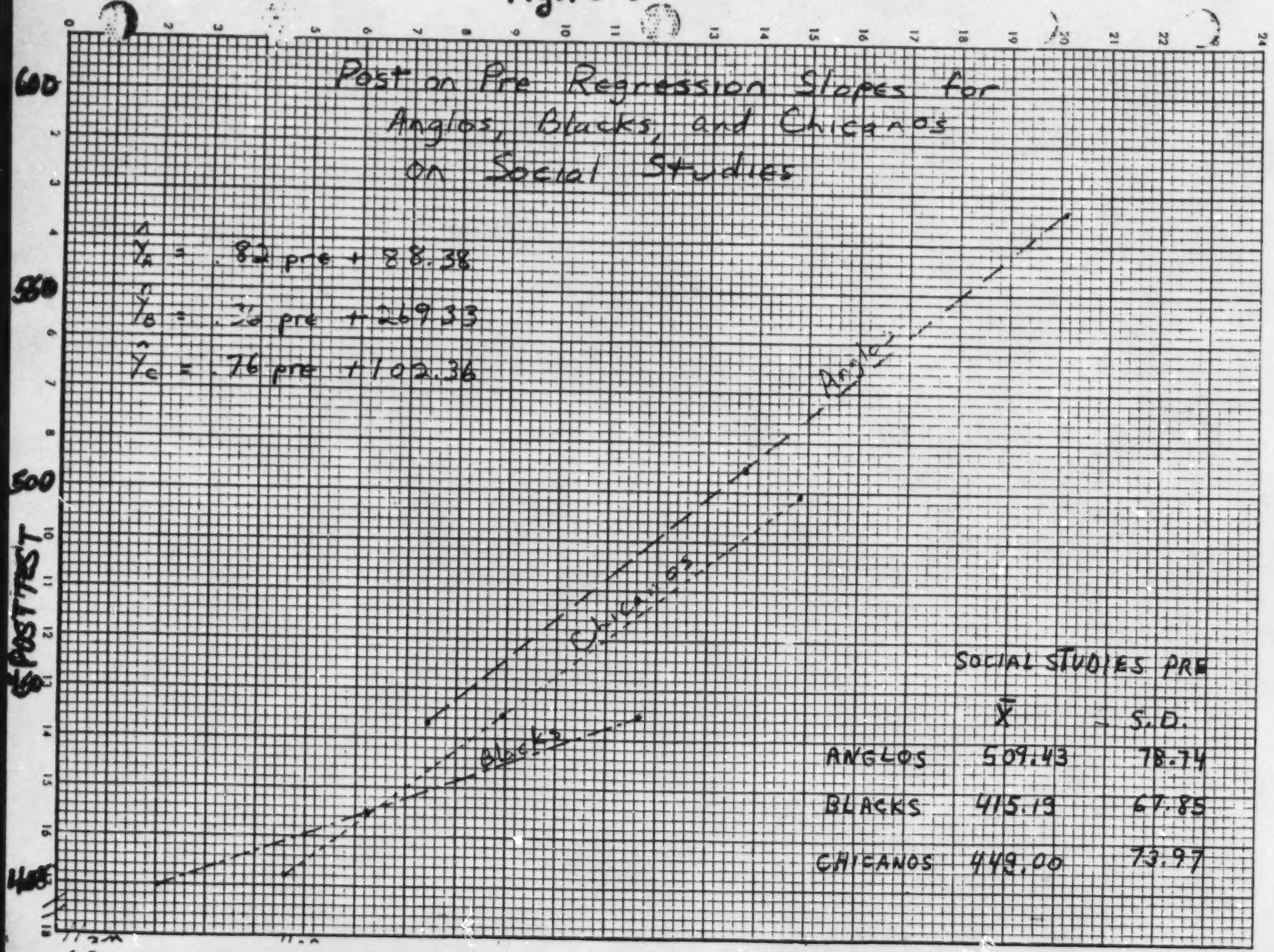
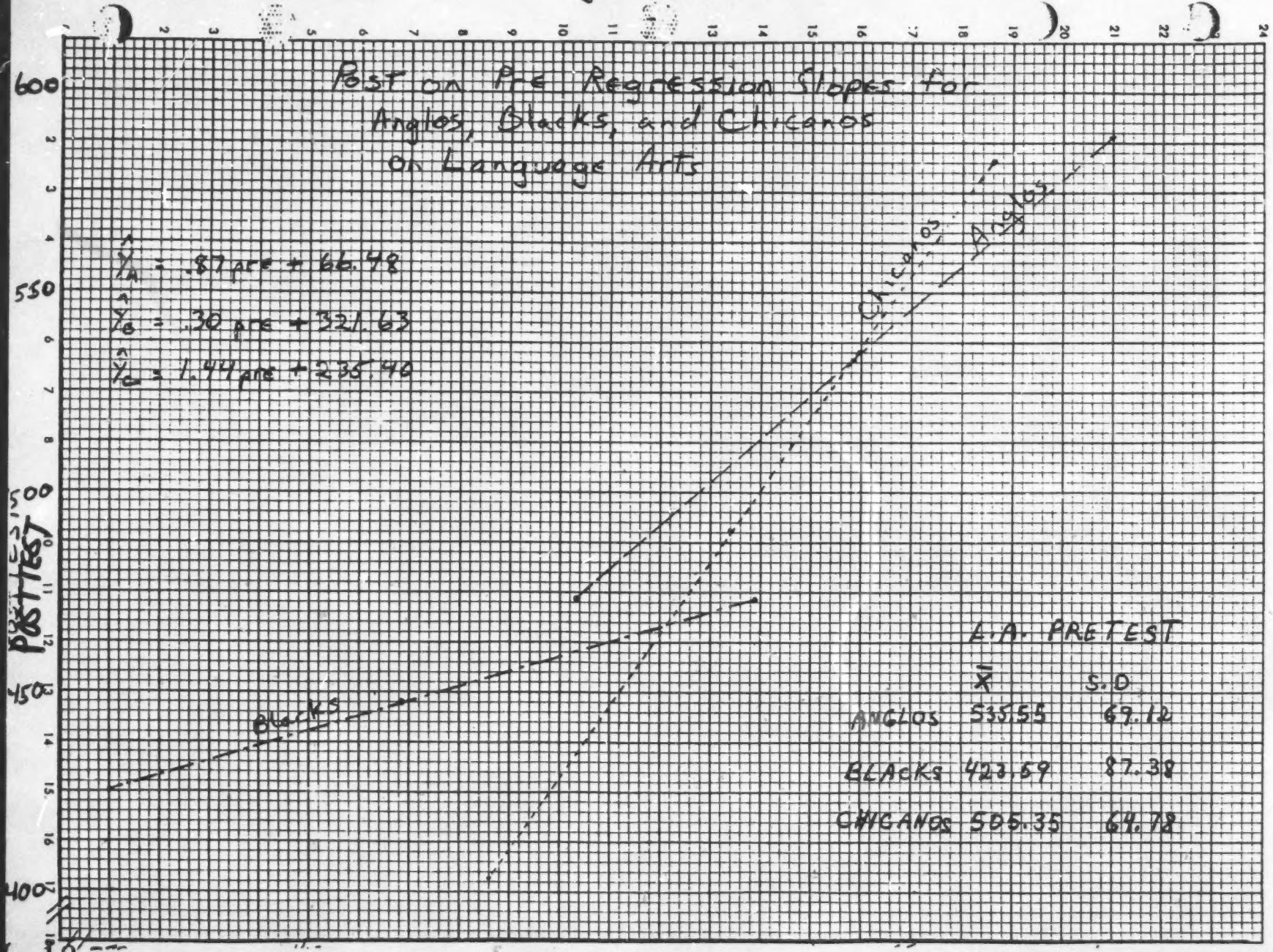

Post on Pre Regression Slopes for
Anglos, Blacks, and Chicanos
on Social Studies
$\hat{Y}_A$ = .82 pre + 88.38
$\hat{Y}_B$ = .36 pre + 269.33
$\hat{Y}_C$ = .76 pre + 102.36
POSTTEST
600
550
500
450
SOCIAL STUDIES PRE
$\bar{X}$
S.D.
ANGLOS 509.43 78.74
BLACKS 415.19 67.85
CHICANOS 449.00 73.97

Figure 1


Post on Pre Regression Slopes for
Anglos, Blacks, and Chicanos
on Language Arts
$\hat{Y}_A$ = .87 pre + 66.48
$\hat{Y}_B$ = .30 pre + 321.63
$\hat{Y}_C$ = 1.44 pre + 235.96
POST TEST
600
550
500
450
400
ANGLOS
BLACKS
CHICANOS
L.A. PRETEST
$\bar{X}$ S.D
ANGLOS 535.55 69.12
BLACKS 423.69 87.38
CHICANOS 505.35 69.78